UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
CHEMICAL SAFETY AND
POLLUTION PREVENTION

April 25, 2012

MEMORANDUM

SUBJECT: Review of Leach Rate Data for Pettit Hydrocoat ECO Antifouling Paint 1104 White, 1204 Blue, 1604 RED, and 1804 Black (all contain Tralopyril, 6 % w/w, Zinc Pyrithione, 4.8 % w/w)

PC Codes: 119093, 088002	DP Barcode: 399339
Decision No.: 460398	Registration Nos.: 60061-RGT
Petition No(s).: NA	Regulatory Action: Review of Leaching from Boat Paints
Risk Assessment Type: Dual Active	Case No.: N/A
TXR No.: NA	CAS No.: 122454-29-9, 13463-41-7
MRID Nos.: 48734904, 48734905,48734906, 48734907	40 CFR: 160

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INTRODUCTION:

Kop-Coat Specialty Coatings, LLC, has submitted special leaching studies for Pettit Hydrocoat ECO Antifouling Paint 1104 White , Pettit Hydrocoat ECO Antifouling Paint 1204 Blue, Pettit Hydrocoat ECO Antifouling Paint 1604 Red, and Pettit Hydrocoat ECO Antifouling Paint 1804 Black containing 6 % w/w tralopyril (Econea®, PC Code 119093) and 4.8 % Zinc Pyrithione (PC Code 088002) antifouling agents. These studies are included in MRIDs 48734904, 48734905, 48744906, and 48734907 which contain data on both of these active ingredients. The attached Data Evaluation Record (DER) includes the summarized results from all the above studies, which have undergone review by James Breithaupt of the Antimicrobial Division's Risk Assessment and Science Support Branch (RASSB). **The studies are acceptable and satisfy the ASTM Standard Test Method D5108-90 data requirement for these Antifouling Paint products.**

CITATIONS:

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1104 White. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-100, MRID 48734904.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1204 Blue. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-101, MRID 48734905.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1604 Red. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-102, MRID 48734906.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1804 Black. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-103, MRID 48734907.

DATA EVALUATIONS: Attached.

CONCLUSIONS:

The submitted special leaching studies are acceptable and satisfy the ASTM Standard Test Method D5108-90 for aqueous availability for the above paints. The test materials employed in the test were Tralopyril (Econea®, PC Code 119093) and Zinc Pyrithione (PC Code: 088002). Table 1 below contains the calculated leaching rates for Econea and Zinc pyrithione.

Table 1. Econea and Zinc Pyrithione Leaching Rates[1]

	Econea			Zinc Pyrithione		
White Paint (48734904)	**Rate[2]**	**Value**	**Time Interval**	**Rate[2]**	**Value**	**Time Interval**
	Maximum	48	1 day	Maximum	55	1 day
	Minimum	14	42 days	Minimum	28	45 days
	Average	30	1-14 days	Average	50	1-14 days
	Average	21	1-45 days	Average	39	1-45 days
	Cumulative	381	1-14 days	Cumulative	671	1-14 days
	Cumulative	881	1-45 days	Cumulative	1,736	1-45 days
Blue Paint (48734905)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	48	1 day	Maximum	49	1 day
	Minimum	10	45 days	Minimum	24	45 days
	Average	36	1-10 days	Average	47	1-10 days
	Average	20	1-45 days	Average	34	1-45 days
	Cumulative	351	1-10 days	Cumulative	451	1-10 days
	Cumulative	842	1-45 days	Cumulative	1,536	1-45 days
Red Paint (48734906)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	45	1 day	Maximum	47	1 day
	Minimum	8	45 days	Minimum	26	45 days
	Average	34	1-10 days	Average	44	1-10 days
	Average	18	1-45 days	Average	34	1-45 days
	Cumulative	325	1-10 days	Cumulative	418	1-10 days
	Cumulative	782	1-45 days	Cumulative	1,535	1-45 days
Black Paint (48734907)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	31	1 day	Maximum	80	1 day
	Minimum	12	45 days	Minimum	20	45 days
	Average	24	1-10 days	Average	60	1-10 days
	Average	17	1-45 days	Average	34	1-45 days
	Cumulative	232	1-10 days	Cumulative	578	1-10 days
	Cumulative	706	1-45 days	Cumulative	1,442	1-45 days

1 All paints contained 6 % w/w Econea and 4.8 % w/w Zinc pyrithione.

2 Maximum, minimum, and average leaching rates were in ug/cm^2/day, while, cumulative rates were in ug/cm^2.

If there are any questions, please contact Jim Breithaupt by phone at 703-305-5925 or by e-mail at breithaupt.james@epa.gov.

LEACH RATE OF ECONEA® and ZINC OMADINE FROM PETTIT HYDROCOAT ECO ANTIFOULING PAINTS IN SYNTHETIC SEAWATER

DATA EVALUATION REPORT

PRODUCT FORMULATIONS:	**Pettit Hydrocoat ECO Antifouling Paint 1104 White, 1204 Blue, 1604 Red, and 1804 Black**
ACTIVE INGREDIENTS:	**Tralopyril (Econea®, 6 % w/w), Zinc Pyrithione (4.8 % w/w)**

BACKGROUND:

The submitted leaching studies were conducted to determine the leach rate of Pettit Hydrocoat ECO Antifouling Paint 1104 White, 1204 Blue, 1604 Red, and 1804 Black into substitute seawater.

CITATIONS:

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1104 White. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-100, MRID 48734904.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1204 Blue. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-101, MRID 48734905.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1604 Red. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-102, MRID 48734906.

Sinning, D.J. 2011. Leach Rate Determination of Pettit Hydrocoat ECO Antifouling Paint 1804 Black. Unpublished study performed Case Laboratories, Inc., Whippany, NJ, and submitted by Kop-Coat Specialty Coatings, Rockaway, NJ. Study # 390-103, MRID 48734907.

EXECUTIVE SUMMARY:

The studies were conducted to determine the leach rates of Econea and Zinc Pyrithione from Pettit Hydrocoat ECO Antifouling Paint 1104 White, 1204 Blue, 1604 Red, and 1804 Black into substitute seawater under laboratory conditions over a period of 45 days. The study was conducted according to ASTM Designation D5108-90 and in compliance with USEPA 40 CFR Part 160. These studies are acceptable and satisfy the D5108-90 data requirement for these antifouling paints.

MATERIALS AND METHODS

A *ca.* 10 cm band of formulated test paint, with an area of *ca.* 200 cm^2, was applied to polycarbonate cylinders (*ca.* 6.34 cm i.d., *ca.* 15 cm length). The test paint was applied to the cylinders using a sponge applicator, and the cylinder was allowed to dry for 7 days prior to storage in a holding tank containing substitute seawater maintained at 25.0 $\pm$ 1°C with pH ranging from 7.9-8.1 and salinity ranging from 33-34 ppt. Each cylinder was positioned so that the painted surfaces were completely immersed in the water. Measurements of water temperature, pH, and salinity were conducted throughout the study.

Treated cylinders were put into tanks containing 1.5 L of synthetic sea water at 25 $\pm$ 1 °C and rotated at 60 $\pm$ 5 rpm for 60 minutes in darkness. For both Econea and Zinc pyrithione, the cylinders were removed at 1, 3, 7, 10, 14, 21, 24, 28, 31, 35, 38, 42, and 45 days. For each time interval, a 25 ml sample of seawater was placed in a 1-oz glass bottle which was sealed with a polyvinyl liner cap. The bottles were placed in an oven at 50 $\pm$ 5 °C for 3-24 hours to degrade Econea to its degradate 322,250, and then refrigerated as necessary until analyzed.

Samples were compared against known standards of Econea (**Parent compound**, 5, 50, and 500 ppb nominal), **zinc pyrithione** (0, 10, 20, 100, and 200 ppb nominal), and degraded Econea (**CL 322,250, BCCPCA**, 3-bromo-5-(4-chlorophenyl)-4-cyano-1H-pyrole-2-carboxylic acid (5, 50, 100, 250, and 500 ppb nominal). The third standard was used because parent Econea is unstable, and the registrant forced a degradation to BCCPCA and adjusted the analytical results to account for differences in molecular weight (4/19/2012 e-mail from Frank Winkleman, Kop-Coat Marine Group to Karen Leavy of EPA)

The synthetic seawater containing Econea and Zinc pyrithione was derivatized using 2,2'-dithiopyridine (PDS) and EDTA followed by analysis using HPLC. The samples were allowed to stand for 30 minutes prior to HPLC analysis. Both compounds were identified by comparison to chromatograms of a derivatized reference standard.

RESULTS AND DISCUSSION

Maximum, minimum, average and cumulative leaching release rates of both Econea and Zinc pyrithione were calculated for different levels of exposure. As expected, the maximum leaching rates occurred at the beginning of the studies, and generally declined with time to minimum rates. The average rates at the beginning of the studies were arithmetic means of 0-14 days or 0-10 days, depending on the presence of a 14-day sample. If a 14-day sample was present, then a 0-14 day average was calculated. A 0-45 day average leaching rate was calculated for the entire study length. Cumulative release rates were calculated by multiplying the average dynamic leach rates at each time point by the number of days in the interval represented by the time point and then summing the values. Table 1 below contains the different leaching values for the paints in the submitted studies.

For **WHITE** paint, the individual leach rates of Econea ranged from a high of 48 ug/cm^2/day at one (1) day, and declined to 14 ug/cm^2/day at day 42 (end of study was 45 days). The short-term and long-term average leach rates were 30 and 21 ug/cm^2/day at 14 and 45 days, respectively. Cumulative leach rates were 381 and 881 ug/cm^2 for 14 and 45 days, respectively. The individual leach rates of Zinc pyrithione ranged from a high of 55 ug/cm^2/day at one (1) day, and declined to 28 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 50 and 39 ug/cm^2/day at 14 and 45 days, respectively. Cumulative leach rates were 671 and 1,736 ug/cm^2 for 14 and 45 days, respectively.

For **BLUE** paint, the individual leach rates of Econea ranged from a high of 48 ug/cm^2/day at one (1) day, and declined to 10 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 36 and 20 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 351 and 842 ug/cm^2 for 10 and 45 days, respectively. The individual leach rates of Zinc pyrithione ranged from a high of 49 ug/cm^2/day at one (1) day, and declined to 24 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 47 and 34 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 451 and 1,536 ug/cm^2 for 10 and 45 days, respectively.

For **RED** paint, the individual leach rates of Econea ranged from a high of 45 ug/cm^2/day at one (1) day, and declined to 8 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 34 and 18 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 325 and 782 ug/cm^2 for 10 and 45 days, respectively. The individual leach rates of Zinc pyrithione ranged from a high of 47 ug/cm^2/day at one (1) day, and declined to 26 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 44 and 34 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 418 and 1,535 ug/cm^2 for 10 and 45 days, respectively.

For **BLACK** paint, the individual leach rate of Econea ranged from a high of 31 ug/cm^2/day at one (1) day, and declined to 12 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 24 and 17 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 232 and 706 ug/cm^2 for 10 and 45 days, respectively. The individual leach rates of Zinc pyrithione ranged from a high of 80 ug/cm^2/day at one (1) day, and declined to 20 ug/cm^2/day at day 45 (end of study). The short-term and long-term average leach rates were 60 and 34 ug/cm^2/day at 10 and 45 days, respectively. Cumulative leach rates were 578 and 1,442 ug/cm^2 for 10 and 45 days, respectively.

Table 1. Econea and Zinc Pyrithione Leaching Rates[1]

	Econea			Zinc Pyrithione		
White Paint (48734904)	**Rate[2]**	**Value**	**Time Interval**	**Rate[2]**	**Value**	**Time Interval**
	Maximum	48	1 day	Maximum	55	1 day
	Minimum	14	42 days	Minimum	28	45 days
	Average	30	1-14 days	Average	50	1-14 days
	Average	21	1-45 days	Average	39	1-45 days
	Cumulative	381	1-14 days	Cumulative	671	1-14 days
	Cumulative	881	1-45 days	Cumulative	1,736	1-45 days
Blue Paint (48734905)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	48	1 day	Maximum	49	1 day
	Minimum	10	45 days	Minimum	24	45 days
	Average	36	1-10 days	Average	47	1-10 days
	Average	20	1-45 days	Average	34	1-45 days
	Cumulative	351	1-10 days	Cumulative	451	1-10 days
	Cumulative	842	1-45 days	Cumulative	1,536	1-45 days
Red Paint (48734906)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	45	1 day	Maximum	47	1 day
	Minimum	8	45 days	Minimum	26	45 days
	Average	34	1-10 days	Average	44	1-10 days
	Average	18	1-45 days	Average	34	1-45 days
	Cumulative	325	1-10 days	Cumulative	418	1-10 days
	Cumulative	782	1-45 days	Cumulative	1,535	1-45 days
Black Paint (48734907)	**Rate**	**Value**	**Time Interval**	**Rate**	**Value**	**Time Interval**
	Maximum	31	1 day	Maximum	80	1 day
	Minimum	12	45 days	Minimum	20	45 days
	Average	24	1-10 days	Average	60	1-10 days
	Average	17	1-45 days	Average	34	1-45 days
	Cumulative	232	1-10 days	Cumulative	578	1-10 days
	Cumulative	706	1-45 days	Cumulative	1,442	1-45ays

1 All paints contained 6 % w/w Econea and 4.8 % w/w Zinc pyrithione.

2 Maximum, minimum, and average leaching rates were in ug/cm^2/day, while, cumulative rates were in ug/cm^2.

III. STUDY DEFICIENCIES

None

IV. REVIEWERS COMMENTS

None

VI. REFERENCES

1. ASTM. 1996. Standard Test Method for Organotin Release Rates of Antifouling Coating Systems in Sea Water. D5108-90. Annual Book of ASTM Standards.